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A comparative profile of the Internet gambler: Demographic characteristics, game-play patterns, and problem gambling status

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Abstract

Overcoming the methodological limitations of many previous studies, the present study employs a two-phased approach to data collection, and a weighted approach to data analysis, thereby obtaining survey data from 1954 Internet gamblers and 5967 non-Internet gamblers. Using this data, the authors examine: (1) the comparative demographic and health characteristics of Internet versus land-based gamblers; (2) the characteristics predictive of Internet gambling; (3) the game-play patterns of Internet gamblers; (4) the comparative gambling expenditures of Internet versus land-based gamblers; and (5) the comparative rate of problem gambling among Internet versus land-based gamblers. The article concludes with a discussion of the methodological implications the present study holds for future research. Moreover, in light of the key finding that Internet gamblers are three to four times more likely to have a gambling problem, the article concludes with a discussion of relevant theoretical and policy implications.

Keywords

expenditures, gambling, gaming, Internet, methods, online, pathological, patterns, problem, survey

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Introduction

Beginning in the early to mid-1990s, as Internet access expanded into workplaces and private residences, gamblers were introduced to a new realm of Internet-based gambling opportunities. Each of the traditional forms of gambling, widely available in land-based venues, soon appeared in electronic format over the Internet, and have since been easily accessible to any person with an Internet connection and means of electronically transferring money. Virtually mediated casino table games, slot machines, poker, bingos, lotteries, sports wagering, horse race betting, and skill games are all now readily accessible, with new forms of gambling and new sites being added each year. Indeed, in August 2009, there were 2243 Internet gambling websites in operation (CasinoCity, 2009), with recent international Internet gambling prevalence rates ranging from 0.4 percent in Iceland to 10.5 percent in the United Kingdom (see American Gaming Association, 2008; Gambling Commission, 2010; Jonsson and Ronnberg, 2009; Motivaction International, 2005; Olason and Gretarsson, 2009; Sandven, 2007; Wood and Williams, 2009).

While the rate of Internet gambling is relatively low, in every jurisdiction, that rate is likely to increase as more jurisdictions opt to regulate and legalize Internet gambling, and as citizens are thereby exposed in greater numbers to Internet gambling as a legitimate and easily accessible gambling option. Unfortunately, however, in most jurisdictions, the expansion of Internet gambling is out-pacing the creation of effective regulatory policies. Consequently, we find ourselves in a situation where we have insufficient knowledge of Internet gambling, including the characteristics and game preferences of Internet gamblers, the social and psychological dynamics of Internet gambling behavior, and the potential link between Internet gambling and problem gambling. Moreover, and more importantly, we have limited knowledge on the extent to which Internet gamblers systematically differ from their land-based counterparts.

In light of the persisting substantive gap in the academic literature, the present study is offered as a comprehensive and comparative overview of Internet gamblers. Drawing upon survey data from 1954 international Internet gamblers and 5967 land-based gamblers, the present study seeks to address several important research questions:

1. What are the comparative demographic and health characteristics of Internet versus land-based gamblers?
2. What demographic characteristics are predictive of Internet gambling?
3. What are the game play patterns of Internet gamblers?
4. What are the comparative gambling expenditures of Internet versus land-based gamblers?
5. What is the comparative rate of problem gambling among Internet versus land-based gamblers?

Having addressed these questions, the article concludes with a detailed discussion of how the present findings conform to or diverge from those observed in previous studies. Thus, as opposed to beginning this manuscript with a traditional review of literature, we instead incorporate the review of literature into our discussion of findings, in order to facilitate a direct comparison between our own findings and those of past researchers.

Methodology

Obtaining a small representative sample of Canadian Internet gamblers

A number of studies of the characteristics of Internet gamblers have been conducted over the past several years (see Williams and Wood, 2007 and Wood and Williams, 2009 for a review). Unfortunately, almost all of them have relied on convenience samples, whereby Internet gamblers self-select themselves into an online study. Researchers in these past studies do indeed acknowledge that the generalizability of their conclusions is severely limited by non-random sampling techniques, but correctly point out that the low prevalence rate of Internet gambling makes it prohibitively costly to derive a large random sample of Internet gamblers from the general population. The present study makes substantial progress toward overcoming past limitations of sampling and representativeness, by using a two-phased approach to data collection, and a weighted approach to data analysis.

Our first phase of data collection involved conducting a computer-assisted random digit dial telephone survey of 8498 Canadians. The household member was randomly selected, the majority of the phoning occurred in the evening and on weekends, and most refusals were contacted again at a later time and asked to reconsider doing the survey. The 'Canadian Telephone Survey' was kept short to increase the chances the person would participate (average of 12.7 minutes), and the survey was conducted either in English or French, depending on the respondent's preference. There were exhaustive attempts to contact the person (up to 48 attempts). Phone calls were spread over an 18-month period, from January 2006 to June 2007, to mitigate any seasonal fluctuations in gambling behavior and to maximize the chances of contacting the person.

Of the 8498 adults surveyed, 6010 were gamblers, including 179 Internet gamblers (299 if including Internet stock market gambling). An overall response rate of 45.6 percent to the telephone survey was achieved using calculations recommended by the Council of American Survey Research Organizations (CASRO, 1982), which essentially is the number of completions divided by the estimated number of eligible respondents. To ensure that the sample was a representative sample of Canadian adults, the data was weighted by: a) *provincial size,* to ensure that each province's representation in the final data set was proportionate to its population in 2006/2007; b) *household size,* to correct for the undersampling of individuals from large households and the oversampling of people from small households; c) *age by gender,* to ensure that the sample approximated the prevalence of each age by gender grouping in the 2006 Canadian census, thereby correcting for the undersampling of males and younger people that typically occurs in telephone surveys.

Obtaining large international samples of land-based and Internet gamblers

In light of other researchers' experiences recruiting Internet gamblers from online gambling-related websites (see Wood and Williams, 2007a), we decided to recruit participants at a prominent gambling web-portal, www.casinocity.com.[1] Casino City is currently one of the most popular online gambling portals (if not the most popular), receiving more than half a million visits per month (personal communication May 2008, Andrea

Mullaney, Casino City). Casino City provides directories and information for both Internet and land-based gambling opportunities, and we therefore felt that drawing a sample from such a website would enable us to draw important statistical comparisons between Internet gamblers and those who gamble only in land-based venues.

We purchased advertising space on www.casinocity.com, and placed banner links on the portal from 15 June through 15 December, 2007. In total, we purchased 2 million impressions, meaning our banner links were shown 2 million times over the 6-month time span. The banner links contained the logo of the university where the authors are employed, along with professionally designed graphics and captions that would appeal to gamblers. Clicking the link directed participants to a homepage for an online questionnaire ('International Online Survey'). At the questionnaire homepage, participants were able to choose from seven languages (English, French, German, Italian, Spanish, Mandarin, and Japanese). These particular languages were chosen as they are the most common languages offered on online gambling sites. Translations of the questionnaire were all done by professional translating services. Having selected a language, participants were then presented with an informed consent preamble, which outlined the purpose of the study, and which reminded potential participants about the voluntary nature of their participation. No personally identifying information was collected about participants, and all participants were assured of complete anonymity in any subsequent research reports or publications. In order to minimize repeat responses, a 'cookie' was built into the survey, such that those who attempted to repeat the survey were politely denied access and reminded that they had already completed the survey once before.[2]

Using this method, 12,521 people completed one or more sections of the online survey. Within this group there were 7921 people who provided comprehensive information about their gambling behavior, 1954 of whom were Internet gamblers (2241 including Internet stock market gambling). People from 105 different countries participated, with the primary countries being: United States (76.3%); Canada (9.6%); and the United Kingdom (3.3%).

Questionnaire

The Canadian Telephone Survey and the International Online Survey contained the following sections, using the same question wording:

1. *Gambling Behavior.* Respondents were asked about their preferred type of gambling, the frequency of their gambling, and their patterns of financial expenditure.
2. *Definition of Gambling.* Respondents were asked about a variety of activities, some of which might be considered traditional forms of gambling, and others which might be commonly understood as risk taking. Our goal was to gauge common perceptions of the conceptual parameters of which activities do or do not qualify as gambling behavior.
3. *Gambling Attitudes Scale.* These questions assessed people's beliefs about the harms versus benefits of gambling, the morality of gambling, and appropriate policy concerning legalization of gambling.
4. *Gambling Fallacies Scale.* This battery of questions consists of 10 items designed to test resistance to common gambling fallacies, such as believing in the ability to manipulate the outcome of a random event.

5. *Problem Gambling.* Problem gambling was assessed using the short 9-item version of the Canadian Problem Gambling Index.
6. *Demographics.* Respondents were asked about their age, gender, ethnicity, employment status, education, and socio-economic status as indicated by income and debt.

Weighting

In order to correct for the self-selected bias of the international online sample, a weighting factor was calculated that matched the characteristics of the subsample of Canadian Internet gamblers from the International Online Survey (n = 171), to the characteristics of the more representative sample of Canadian Internet gamblers from the Canadian Telephone Survey (n = 179).[3]

Statistically, the main differences between the two samples were: average score on the Canadian Problem Gambling Index (3.13 for online recruits versus 1.62 for telephone recruits); net monthly gambling win/loss (median of –$109 for online recruits versus –$89 for telephone recruits); and age (average of 42.01 years for online recruits versus 35.53 years for phone recruits). Weightings for each of these three variables were calculated and used, singly and in combination, to determine which combination produced the best match between the online and telephone samples. Once the weighting factor was determined, it was then applied to the entire online sample to make this much larger and richer data set much more representative. It is this latter, weighted and larger, data set from which the findings of the present study are derived.

Results

Demographic and health characteristics

The demographic characteristics of our international sample are presented in Table 1. In terms of gender distribution, online gamblers were far more likely to be male when compared to land-based gamblers. Internet gamblers were also, on average, younger (45.7 years) than their land-based gambling counterparts (51.2 years). An important policy concern is the extent to which underage gamblers access Internet gambling venues (see Derevensky and Gupta, 2007; Derevensky et al., 2006). The present study found that only 0.4 percent of Internet gamblers were under 18, a rate even lower than that observed among non-Internet gamblers (0.9%).[4] Internet gamblers were also less likely to be married (53.2%), more likely to employed full time (62.7%), more likely to be a student (4.4%), and reported higher average household income ($60,100 US). The household debt of Internet gamblers is not substantially different from that of non-Internet gamblers.

When asked about lifestyle and health, the Internet gamblers in our study reported higher rates of tobacco, alcohol, and street drug use, compared to their non-Internet counterparts (see Table 1). Internet gamblers also reported a somewhat higher rate of substance abuse or dependence (13%), as well as a higher rate of addictions in other areas (10.4%). Both Internet and non-Internet gamblers were relatively similar in terms of mental health problems and the presence of a significant physical disability or chronic health problem.

Table 1. Comparative demographic characteristics of Internet and non-Internet gamblers

	Internet gamblers (%)	Non-Internet gamblers (%)
Gender		
Male	78.0	58.0
Age		
<18	0.4	0.9
18–19	1.7	0.8
20–29	15.9	8.6
30–39	17.2	10.7
40–49	22.5	19.5
50–59	23.6	29.6
60–69	14.5	19.9
70–79	3.6	8.0
80+	0.7	1.8
Average	45.7	51.2
Marital status		
Married	53.2	61.9
Living with partner	13.3	8.6
Widowed	2.1	3.7
Divorced or separated	11.8	11.6
Never married	19.6	14.2
Education		
Less than high school	4.3	5.5
Completed high school	18.2	19.7
Some technical school/college/university	28.4	26.9
Completed technical school	8.0	8.1
Completed college/university	30.2	27.8
Professional or graduate degree	11.0	11.9
Employment		
Employed full-time	62.7	58.0
Employed part-time	7.0	6.3
Homemaker	3.4	3.9
Unemployed and seeking work	2.4	4.7
Retired	16.6	22.6
Student	4.4	1.8
Disability/Leave/Strike	3.5	2.6
Household income		
Less than $29,999 US	21.5	20.8
$30,000–$49,999 US	19.0	21.5
$50,000–$69,999 US	16.3	19.1
$70,000–$89,999 US	14.3	13.5
$90,000–$119,999 US	13.2	12.8
$120,000–$149,999 US	7.3	4.9
More than $150,000 US	8.3	7.5
Average	$60,100 US	$57,600 US
Household debt		
Less than $1000 US	32.3	32.4
Median	$10,000 US	$14,000 US
Average	$76,728 US	$66,948 US
Substance use		
Past month tobacco use	44.3	33.1
Past month alcohol use	72.9	66.4
Past month other drug use	11.7	5.5

Table 1. *(Continued)*

	Internet gamblers (%)	Non-Internet gamblers (%)
Addictions		
History of substance abuse or dependence	13.0	11.5
History of other addictions	10.4	6.7
Health		
Past year serious mental health problem	10.3	10.6
Physical disability or chronic health problem that limits activity	14.9	15.0

Game play patterns of Internet gamblers

Table 2 indicates that Internet gamblers are involved in a wide array of land-based gambling in addition to Internet gambling. Indeed, they report involvement with an average of 4.1 different gambling formats, versus an average of only 2.6 for non-Internet gamblers. Moreover, Internet gamblers have higher yearly and weekly involvement in almost every kind of gambling. The proportionate differences are especially pronounced for sports betting, betting on horse or dog races, and betting on games of skill, such as poker.

Table 3 indicates the percentage of Internet gamblers that engage in each type of online gambling, as well as the gender distribution of the patronage. As the table illustrates, games of skill are by far the most popular type of game, with poker yielding the highest rates of participation, at 54.1 percent. Moreover, certain types of online gambling are clearly preferred by one gender over another. Sports betting, horse/dog race betting, and games of skill are overwhelmingly preferred by males, whereas online bingo is preferred by females.

We asked Internet and non-Internet gamblers to report their typical monthly gambling expenditures for each commonly available gambling type (in the equivalent of US dollars).[5] The average overall expenditures were much higher among Internet gamblers,

Table 2. Involvement in various forms of gambling among Internet and non-Internet gamblers

	Any past year involvement		Weekly involvement in past year	
	Internet gamblers (%)	Non-Internet gamblers (%)	Internet gamblers (%)	Non-Internet gamblers (%)
Lotteries	69.9	70.8	24.2	19.9
Instant win	60.7	57.4	13.7	10.2
Games of skill (e.g. poker) against other individuals	59.3	28.6	41.8	5.9
EGMs	53.2	49.5	10.7	4.8
Casino table games	46.9	21.4	5.9	1.7
Sports betting	41.6	13.6	16.3	2.7
Horse and dog racing	26.2	9.3	6.3	0.9
Bingo	15.7	8.4	3.9	0.6
Average number of games played	4.1	2.6	4.1	2.6

Table 3. Types of games played over the Internet among Internet gamblers

	Internet gamblers (%)	% of patronage that is male	% of patronage that is female
Games of skill (e.g. poker)	64.0	84.0	16.0
Casinos	26.4	67.6	32.3
Sports betting	23.2	92.7	7.3
Horse and dog racing	12.7	92.5	7.5
Lotteries	11.1	63.7	36.3
Bingo	7.4	39.1	60.9

when compared to the non-Internet gamblers (see Table 4). Internet gamblers reported an average net monthly expenditure of –$195.14 US, and non-Internet gamblers report an average net expenditure of –$70.93 US. The median net monthly expenditure for the international Internet gamblers was –$80.00 US, which is more than four times the median expenditure of –$19.26 US reported by their non-Internet counterparts. Additionally, looking at expenditures by game type, we see that Internet gamblers report higher mean expenditures for every form of gambling, with the exception of casino table games.

Problem gambling among Internet gamblers

Using the criteria of the Canadian Problem Gambling Index, a total of 16.4 percent of Internet gamblers were either moderate (CPGI score of 3–7) or severe (CPGI score of 8+) problem gamblers, compared to a rate of 5.7 percent among non-Internet gamblers (see Table 5). Only 39.9 percent of Internet gamblers were classified as non-problem gamblers, which is less than half the rate of 82.1 percent observed among their non-Internet gambling counterparts.

We were interested in assessing the extent to which Internet problem gamblers sought treatment for problems, as well as the viability of Internet-based treatment initiatives (see Table 6). Only a small proportion of Internet problem gamblers (9.4%) reported ever seeking help for a gambling problem. Those who had sought help most commonly reported

Table 4. Comparative net monthly gambling expenditure of Internet and non-Internet gamblers (for gamblers who engage in that type)

	Internet gamblers (%)	Non-Internet gamblers (%)
Casino table games	–$113.56	–$120.53
EGMs	–$94.37	–$70.55
Sports betting	–$39.47	–$14.45
Horse and dog racing	–$35.71	–$24.69
Games of skill (includes poker)	–$35.21	+$9.13
Bingo	–$30.57	–$20.78
Lottery ticket purchases	–$28.05	–$13.48
Instant win tickets	–$13.22	–$8.17
Total expenditure average	–$195.14	–$70.93
Total expenditure median	–$80.00	–$19.26

Table 5. Rates of problem gambling among Internet and non-Internet gamblers

	Internet gamblers (%)	Non-Internet gamblers (%)
Non-problem gambler	39.9	82.1
At-risk gambler	43.4	12.3
Moderate problem gambler	12.8	4.0
Severe problem gambler	3.8	1.7
Average CPGI score	1.80	.52

Table 6. Help seeking for problem gambling among Internet and non-Internet problem gamblers

	Internet gamblers (%)	Non-Internet gamblers (%)
Ever sought help for problems?		
Yes	9.4	5.0
No	90.6	95.0
Where did you seek help from?		
Gamblers Anonymous	21.4	75.0
Counseling service	17.9	0
Friends	10.7	25.0
Psychologist	10.7	0
Psychiatrist	10.7	0
Family doctor	7.1	0
Family	7.1	0
Pastor/Minister/Priest	7.1	0
Telephone help/hot line	7.1	0
If you were to seek help where would you be most comfortable seeking it from?		
Face-to-face counseling	70.2	65.4
Internet counseling	29.8	34.6

either Gamblers Anonymous or some other counseling service as the source of help. Interestingly, only 29.8 percent indicated that they would be most comfortable seeking some sort of Internet-based counseling service.

Characteristics statistically differentiating Internet from non-Internet gamblers

The cross-tabulations and descriptive statistics in the previous section, while instructive, do not indicate the *relative importance* of differentiating variables, or the extent to which the association of some variables to Internet gambling may be an artifact of their correlation with other variables that are primarily responsible for the relationship. Simultaneous analysis of all relevant variables using multivariate logistic regression helps disentangle these effects.

Hence, an SPSS logistic regression investigated characteristics differentiating Internet from non-Internet gamblers. The predictor variables were gender; age; marital status; level of education; employment status; household income; household debt; ethnic origin; country of residence; use of tobacco; use of alcohol; use of illicit drugs;

presence of a physical disability; having a significant mental health problem; number of gambling formats engaged in; net win/loss on all gambling in a typical month; CPGI score; history of substance abuse; history of other addictions; family history of problem gambling; gambling attitudes; and gambling fallacies. The skewness of certain variables (CPGI score; number of gambling formats engaged in; household debt) was reduced with inverse transformations. The significant negative skewness and positive kurtosis of the net win/loss variable could not be corrected. However, 6 outliers with standard scores greater than $\pm$ 5.0 in the net win/loss variable were winsorized. Missing values for all continuous variables were replaced with the series mean. Missing values for most categorical variables were replaced with the mode. Entry of the variables into the equation was simultaneous. Data from 8174 people were available for analysis, including 2254 Internet gamblers[6] and 5919 non-Internet gamblers. Each Internet gambler received a weighting to ensure they had equivalent overall importance to non-Internet gamblers in the calculations used to identify characteristics that maximally differentiated the two groups.

A test of the full model, with 22 predictors, against a constant-only model was statistically significant, χ^2 (50) = 3366.54, $p < .0001$, indicating that the 22 predictors, as a set, reliably distinguished between Internet gamblers and non-Internet gamblers. The variance accounted for was moderate, with a Nagelkerke R squared = 34.7 percent. Overall prediction success was 73.3 percent, with 71.9 percent of non-Internet gamblers correctly classified, and 74.7 percent of Internet gamblers correctly classified. Table 7 shows regression coefficients, Wald statistics, and odds ratios for each of the 22 predictors, with the predictors ordered from strongest to weakest. According to the Wald criterion, the variables that significantly predicted ($p < .001$) someone being an Internet gambler are: gambling on a greater number of gambling formats; higher CPGI score; male gender; living in Hungary, United Kingdom, Italy, Canada, Switzerland, or Costa Rica; tobacco use; fewer gambling fallacies; being employed; younger age; more positive attitudes toward gambling; higher gambling expenditure; not being Asian; never married (single); alcohol use; illicit drug use; and higher household income.

Discussion

Demographic characteristics

Internet gamblers have many distinguishing demographic features. Although they are predominantly male (78.0%), certain types of online gambling are preferred by one gender over another. The patronage of online sports betting, horse/dog race betting, and games of skill is overwhelmingly male, whereas the patronage of online bingo is predominantly female. Marital status and employment status of Internet gamblers tends to reflect the distributions found in the general adult population, with most people being married or living common-law and most being employed full-time. Being divorced/separated or living common-law was the marital status most predictive of being an Internet gambler. Being employed is also significantly associated. Most of the Internet gamblers in our sample are of European ancestry (80.8%). However, being of non-European ancestry significantly predicts Internet gambling. All age groups are represented among

Table 7. Logistic regression of characteristics differentiating Internet from non-Internet gamblers

	B	Wald	Significance	Odds ratio
# Gambling formats	−7.064	948.029	.000	.001
CPGI score	−1.579	422.154	.000	.206
Gender	.920	241.346	.000	2.508
Country		186.323	.000	
Hungary	3.984	49.984	.000	53.731
United Kingdom	.954	48.136	.000	2.597
Italy	1.854	34.926	.000	6.388
Canada	.434	26.944	.000	1.543
Switzerland	1.431	10.389	.001	4.183
Costa Rica	2.798	10.120	.001	16.419
Germany	6.441	9.770	.002	627.018
Netherlands	.907	4.206	.040	2.477
Philippines	.973	4.050	.044	2.645
New Zealand	.845	3.671	.055	2.327
Finland	7.327	1.609	.205	1521.266
Australia	.372	1.254	.263	1.451
Ireland	.210	.264	.607	1.234
France	.226	.227	.634	1.254
Romania	.142	.058	.810	1.153
South Africa	.044	.010	.922	1.045
Sweden	21.573	.000	.997	234,000
Norway	19.945	.000	.998	459,100
Other	.454	17.230	.000	1.575
Tobacco use	.581	92.493	.000	1.787
Gambling fallacies	.138	81.520	.000	1.148
Employment status		56.287	.000	
Unemployed	−.865	35.393	.000	.421
Homemaker	.388	7.983	.005	1.474
Sick leave, Maternity leave, etc.	.385	5.384	.020	1.470
Employed part-time	.223	4.695	.030	1.250
Retired	.082	1.174	.279	1.085
Student	−.158	.796	.372	.854
Age	−.018	55.690	.000	.982
Gambling attitudes	.106	52.078	.000	1.112
Gambling expenditure	.000	50.733	.000	1.000
Ethnic origins		40.151	.000	
Asian	−.514	39.470	.000	.598
European	−.499	6.805	.009	.607
Aboriginal, Inuit or Metis	−.273	1.508	.220	.761
Marital status		32.195	.000	
Never married	.415	25.448	.000	1.514

(Continued)

Table 7. *(Continued)*

	B	Wald	Significance	Odds ratio
Living with a partner	.288	10.955	.001	1.333
Divorced or separated	.176	4.414	.036	1.193
Widowed	.026	.030	.863	1.026
Alcohol use	–.363	31.610	.000	.696
Illicit drug use	.532	22.026	.000	1.702
Household income	.038	17.765	.000	1.039
Household debt	.000	7.691	.006	1.000
Physical disability	.460	6.821	.005	1.285
Mental health problems	–.251	5.373	.020	.778
History of other addictions	.162	1.820	.177	1.176
History of substance abuse	–.100	1.079	.299	.905
Educational achievement	.002	.019	.892	1.002
Family history of problem Gambling	–.006	.002	.964	.994

Internet gamblers, but there is no age group that is markedly overrepresented (average age of Internet gamblers is 45.7). Nonetheless, younger age was a significant predictor of Internet gambling in this data set. Internet gamblers have high past month rates of substance use (44.3% for tobacco and 11.7% for illicit drugs). Any type of substance use is a significant predictor of a person being an Internet gambler. Average household income for Internet gamblers is $60,100 US and average household debt is $76,728 US. Household income significantly predicted Internet gambling status, but debt did not. On average, Internet gamblers are slightly better educated than the average person, with 41.2 percent having completed college or university. This was not predictive of Internet gambling, however. Internet gamblers reported levels of physical disabilities and chronic health problems (14.9%) and mental health problems (10.3%) that were not significantly different from non-Internet gamblers.

The demographic characteristics found in the present study are consistent with previous research. Almost all studies have found Internet gambling to be more common among males. The UK Gambling Commission's ongoing survey of remote gambling has consistently found males to have about twice the rate of online gambling participation compared to females (Gambling Commission, 2010). In a sample of US online casino players, poker players, and sports bettors (n = 522), the American Gaming Association (2006) found that 68 percent were male. In another undifferentiated and self-selected sample of all types of worldwide online gamblers (n = 1920), Wood and Williams (2007a) found 68 percent of the sample to be male. Among a sample of 473 British university students, 85 percent of the Internet gamblers were male (Griffiths and Barnes, 2007).

The gender preferences for specific game type, found in the present study, are consistent with findings from other studies. Woolley (2003) found 85–90 percent male patronage for an Australian TAB company (sports and horse race betting). LaBrie et al. (2007) examined the demographics of everyone opening an account with a European online sportsbook (bwin Interactive Entertainment AG)[7] in February 2005 (n = 40,499) and

found 92 percent to be male. Males outnumbered females, 10 to 1, in a large-scale study of online poker in Sweden (Gaming Intelligence Group, 2007). In contrast, a more equal gender ratio has been found for online casinos. McMillen and Woolley (2003) report that the percentage of males at one well-established Internet casino was only 50 percent. Similarly, in a worldwide self-selected sample of 10,865 online casino and/or poker gamblers from 96 countries, 58 percent were male (with a majority of casino players being female) (eCOGRA, 2007).

Previous studies consistently find that Internet gamblers tend to be young. For example, high rates of online gambling on college campuses are reported by Brown (2006), Griffiths and Barnes (2007), Helstron et al., (2007), and Petry and Weinstock (2007). Here again, the average age of online gamblers appears to be partially a function of game type and perhaps country. Woolley (2003) found that 35–54 was the most common age group among the sports and horse race bettors in his studies. LaBrie et al. (2007) found the average age of European sports bettors to be 31 (*SD* = 10). eCOGRA (2007) found the most common age group for online poker players to be 26–35, but the average age of online casino players to be 46–55. In undifferentiated samples of online gamblers, the average age was 34 in the Wood and Williams (2007a) study, and mid-30s in the AGA study (American Gaming Association, 2006). A survey of European online gaming companies found that 63 percent of their patrons were ages 18–35 (Swiss Institute of Comparative Law, 2006). Online poker players in Sweden are predominantly in their 20s (Gaming Intelligence Group, 2007).

The present study's findings about socioeconomic status are also supported by prior research. Socioeconomic status of online sports and horse race bettors was found to be higher than the Australian average in the studies by Woolley (2003), with a notable percentage of people belonging to professional or managerial occupations (whose jobs rely upon familiarity with and competent use of the Internet). The American Gaming Association (2006) study found that 61 percent of their sample had at least a college degree; 41 percent earned more than $75,000 a year; and almost all of them used the Internet for other activities. Wood and Williams (2007a) found that 60 percent of their sample had at least some post-secondary education, and 65 percent reported being comfortable conducting business and purchasing transactions over the Internet.

Game-play patterns

In terms of game-play patterns, perhaps the most important finding is that virtually all Internet gamblers also gamble on several land-based gambling formats, with 4.1 being the average number of formats among our Internet gambling sample. The number of gambling formats engaged in is more powerful than any other variable (including the demographic ones) for predicting Internet gambling. Furthermore, Internet gamblers engage in *all* types of gambling more frequently than their land-based counterparts, and also report higher average gambling expenditures. Internationally, the average net monthly gambling expenditure is –$195.14 US for Internet gamblers, compared to –$70.93 US for non-Internet gamblers. Hence, what all of this seems to indicate is that Internet gambling is primarily used as an additional form of gambling, added to the repertoire of people who appear to be already heavily involved in gambling.[8]

Problem gambling

The prevalence of problem gambling is 3 to 4 times higher among Internet gamblers in our study, compared to non-Internet gamblers. Having problems with gambling is, in fact, one of the characteristics that best predicts that someone is an Internet gambler. Among our sample, 16.6 percent were either moderate or severe problem gamblers, versus a rate of 5.7 percent among land-based gamblers. This finding is very consistent with findings from other studies. In an online study of 422 self-selected online university poker players, 18 percent of the sample was classified as problem gamblers using DSM-IV criteria (Griffiths et al., 2006). Internet gamblers were also significantly more likely to be problem gamblers in another study of university students by Griffiths and Barnes (2007). In a study of disordered gambling among university students, Ladd and Petry (2002) found that the mean South Oaks Gambling Screen (SOGS) score (7.8) among university Internet gamblers was over 4 times higher than the mean SOGS score (1.8) for non-Internet gamblers. A 2005 study of 12,717 Dutch Internet users between 18 and 55 years old found that 14 percent of online gamblers were 'at risk' of problem behavior, but none actually evidenced problematic behavior (Motivaction International, 2005).[9] Among a self-selected online sample of 1920 Internet gamblers, Wood and Williams (2007a) found 23 percent to be moderate problem gamblers on the Canadian Problem Gambling Index, and another 20 percent were found to be severe problem gamblers. In a 2006 study of 16,500 Swedish poker players, 27 percent were classified as potential problem gamblers (Gaming Intelligence Group, 2007). A similar study of 3000 Swedish online poker players by Jonsson (2008) found 23 percent of players were either moderate or severe problem gamblers as measured by the CPGI.

From a policy perspective, it is important to understand the role that Internet gambling plays in the development of problem gambling. There are several aspects of Internet gambling that may increase the risks for problem gambling. These include the much greater convenience and ease of access; the relative comfort of playing at home; the greater anonymity; the solitary nature of the play; the immersive nature of the interface; the fact that gamblers are playing with 'electronic' cash; the ability to play multiple sites/games simultaneously; and the ability of online gamblers to play under the acute influence of drugs or alcohol[10] (Griffiths, 1996, 1999, 2003; Griffiths and Parke, 2002; Griffiths and Wood, 2000; King, 1999; King and Barak, 1999; LaRose et al., 2001; Schull, 2005; Shaffer, 1996; Wood et al., 2007). In the present study, roughly half of Internet problem gamblers reported there was a specific type of gambling that contributed to their problems more than others, with slot machines (23.8%), poker (21.7%), and Internet gambling (11.3%) being the most commonly reported. Hence, the implication is that while Internet gambling is an important contributing factor to gambling problems in a portion of problem gamblers, it does not appear to be the main cause of problem gambling for most of them.[11] This is consistent with the evidence that Internet gamblers are likely heavy gamblers to begin with, who have simply added Internet gambling to their repertoire.

Roughly 9 percent of Internet problem gamblers had sought help for their problems and they had sought help from a wide variety of sources. Interestingly, the large majority of Internet problem gamblers would be more comfortable seeking help from a face-to-face counseling service rather than from Internet counseling services (perhaps because

accessing the Internet for help also puts them at risk for online gambling). Some researchers had posited that Internet gamblers might be particularly receptive to Internet-based counseling or other online interventions (Horton et al., 2001; Monaghan, 2009; Wood and Williams, 2007a).[12] However, the present results suggest that while online services can serve as a useful adjunct to land-based treatment, they are not likely to be a panacea for this particular population.

Conclusion

Internet gambling is a relative newcomer to the world of gambling opportunities, but the number and variety of Internet gambling venues, as well as the ease of access to those venues, has progressed with incredible speed since the late 1990s. This speed of progression has left most jurisdictions in a situation of cultural lag; a term which sociologists commonly use to refer to conditions where a society experiences a gap between developments in technology and the moral/legal institutions intended to shape and regulate such developments. In other words, the phenomenon of Internet gambling developed with such velocity that it outpaced the ability of both the research and policy-making communities to understand the nature of the phenomenon and to determine the most appropriate ways of regulating it. Thankfully, recent studies are shedding much-needed light onto the nature and dynamics of Internet gambling, and we believe that the present study makes a notable contribution to the broader goal of understanding.

As the research community generates increasingly valid data about the characteristics of Internet gamblers, their gambling patterns, and their propensity for problem gambling, an empirical foundation is being laid upon which governments and policy makers can decide how to best proceed. Ultimately, all jurisdictions will have to confront the reality of Internet gambling, and will be tasked with designing appropriate policies along a continuum anchored by complete prohibition, on the one end, and complete non-regulation, on the other. Thus, we conclude this article with an appeal for subsequent policy-oriented research, rooted in validated facts about Internet gamblers and the nature of Internet gambling. In particular, future policy will benefit from empirical research on: (1) responsible and irresponsible Internet gambling business practices; (2) the relationship between Internet gambling and problem gambling; (3) the source and nature of Internet gambling revenue, with a particular focus on revenue generated for governments; (4) the viability of Internet-based prevention and treatment programs; and (5) the social and economic costs of government sponsored Internet gambling.

In pursuing these issues, researchers must overcome a range of methodological dilemmas associated with the study of Internet gamblers, and we hope that the present study will assist in that respect. The primary methodological difficulty for researchers is the recruitment of samples of Internet gamblers that are both large and representative. Indeed, given the low prevalence rate of Internet gambling in the general population, it is difficult to generate a large and representative sample, using typical randomization techniques, such as random digit dialing. To achieve a sample size of only 500 Internet gamblers, for example, approximately 25,000 adults in the general population (at least in the Canadian context) would need to agree to a telephone interview. The costs associated with such a project would far exceed the levels of research funding that are normally available to the academic researcher. It is indeed easy to generate a large yet self-selected

sample of Internet gamblers, via recruitment efforts at Internet gambling-related websites. It is not possible, however, in the absence of corroborating information, to generalize from such samples to the broader population. We maintain that the two-tiered sampling protocol, used in the present study, represents a reasonable and relatively valid compromise. Thus, we encourage other researchers to adopt a similar approach; that is, recruiting a large self-selected online sample, in conjunction with a small yet representative sample, which would then be used for the purpose of weighting. Such an approach is certainly not immune to methodological critique, but it is nonetheless superior to using convenience samples, however large they may be, as the sole foundation for research.

In addition to making important methodological contributions to the academic literature, this article raises questions of a broader theoretical nature. In particular, the consistent finding of an association between Internet gambling and problem gambling (confirmed in the present study) raises questions about the legitimacy of government expansion into Internet gambling. Indeed, governments in many jurisdictions, including Canada, are making serious and meaningful efforts to expand into the business of Internet gambling, and are doing so without an adequate appreciation of the associated personal and societal risks (Gainsbury and Wood, 2010). While we hope that the current study can be used as a partial foundation for responsible and well-considered policies, this study speaks to the broader need to readdress whether governments should be in the business of gambling at all, and the extent to which government-sponsored gambling is properly aligned with the essence and the goals of democratic government in our society.

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Notes

1. Gambling web portals provide listings of available gambling venues/sites in different jurisdictions.
2. It is, of course, possible for people to remove cookies from their computer hard drive. However, our pilot study of online research methodology enabled us to identify repeat responders, and we found that only 38 respondents, out of 1844, or 2.1 percent, were 'repeat customers' (Wood and Williams, 2007a). Thus, we are confident that repeat responders pose only a small and insignificant contribution to the data set.
3. This does require the assumption that the sampling biases of online Canadian Internet gamblers are similar to the sampling biases of online Internet gamblers from other countries. While we believe this is a reasonable assumption (both theoretically, and based on the data), it is a difficult one to unambiguously prove. Nonetheless, this procedure still represents a substantial methodological improvement over not weighting the data at all (which has been done in all other online surveys collected in this manner).
4. Investigation of underage gambling was not done with the Canadian Telephone Survey because of ethical and logistical issues (i.e., need to obtain parental permission to survey underage youth over the phone).
5. Based on our findings in a past study of the optimal way of wording gambling expenditure questions (see Wood and Williams, 2007b), we asked respondents to report how much money they 'spend on gambling in a typical month,' emphasizing that 'spend' refers to net loss/win.

6. This the available number of Internet gamblers after data were weighted. Prior to weighting, only 1954 were available.
7. An Austrian Sportsbook registered in Gibraltar. Transactions in Euros only.
8. Although this is the most plausible scenario, it must be remembered that because this is correlational data, the directional relationship cannot be unambiguously determined (i.e., it is possible that engagement in Internet gambling led to engagement in multiple forms of land-based gambling).
9. It is not clear how 'at-risk' and 'problem behaviors' were defined.
10. Substance use while gambling has a direct link to excessive and disinhibited play (Baron and Dickerson, 1999; Ellery et al., 2005; Kyngdon and Dickerson, 1999).
11. Of course, it must be recognized that the data simply reflect problem gamblers' *perceptions* of what forms were most problematic.
12. Online counseling is currently being offered in the UK. Supported by the Responsibility in Gambling Trust, GamAid provides 'instant, real-time, one-to-one professional guidance for remote gamblers whose gambling activities are out of control or for those who wish to better understand the concepts of responsible gaming' (Wood and Griffiths, 2006). Early findings indicate that while only 1 percent of online gamblers accessed the link button from participating gambling websites, women in particular found the service to be helpful.

References

American Gaming Association (2006) *Gambling and the Internet*. *2006 AGA Survey of CasinoEntertainment*. Available at: http://www.americangaming.org/assets/files/2006_Survey_for_Web.pdf (accessed 21 December 2010).

American Gaming Association (2008) State of the States: The AGA Survey of Casino Entertainment 2008. Available at: http://www.americangaming.org/assets/files/aga_2008_sos.pdf (accessed 12 April 2011).

Baron E and Dickerson MG (1999) Alcohol consumption and self-control of gambling behaviour. *Journal of Gambling Studies* 15: 3–15.

Brown SJ (2006) The surge in online gambling on college campuses. *New Directions for Student Services* 113: 53–61.

Casino City (2009) *Online Casino City*. Available at: http://online.casinocity.com (accessed 21 September 2009).

Council of American Survey Research Organizations (CASRO) (1982) *On the Definition of Response Rates*. Port Jefferson, New York: CASRO.

Derevensky JL and Gupta R (2007) Internet gambling amongst adolescents: A growing concern. *International Journal of Mental Health and Addiction* 5(2): 93–101.

Derevensky JL, Gupta R and McBride J (2006) Internet gambling among youth: A cause for concern. Presentation at the Global Remote and e-Gambling Research Institute Conference, 31 August–1 September 2006. Amsterdam, Netherlands.

eCOGRA (2007) *An Exploratory Investigation into the Attitudes and Behaviours of Internet Casino and Poker Players*. Available at: http://www.ecogra.org/Downloads/eCOGRA_Global_Online_Gambler_Report.pdf (accessed 13 July 2007).

Ellery M, Stewart SH and Loba P (2005) Alcohol's effects on video lottery terminal (VLT) play among probable pathological and non-pathological gamblers. *Journal of Gambling Studies* 21(3): 299–324.

Gainsbury S and Wood RT (2010) Is legalized gambling in North America inevitable? An international perspective. Presentation at the Ontario Responsible Gambling Council, Discovery Conference, 14 April. Available at: http://www.responsiblegambling.org/articles/Sally_Gainsbury.pdf (accessed 16 September 2010).

Gambling Commission (2010) Survey Data on Gambling Participation. Available at: http://www.gamblingcommission.gov.uk/pdf/Survey%20data%20on%20gambling%20participation%20-%20October%202010.pdf (accessed 16 March 2011).

Gaming Intelligence Group (2007) *Results of Swedish Online Gambling Study Released*. Available at: http://www.responsiblegambling.org/articles/Results_of_Swedish_Online_Gambling_Study_released.pdf (accessed 5 October 2007).

Griffiths M (1996) Gambling on the Internet: A brief note. *Journal of Gambling Studies* 12*(*4): 471–473.

Griffiths M (1999) Gambling technologies: Prospects for problem gambling. *Journal of Gambling Studies* 15(3): 265–283.

Griffiths M (2003) Internet gambling: Issues, concerns, and recommendations. *CyberPsychology & Behavior* 6(6): 557–568.

Griffiths M and Barnes A (2007) Internet gambling: An online empirical study among student gamblers. *International Journal of Mental Health and Addiction*. Available at: http://0-springerlink.metapress.com.darius.uleth.ca/content/pw2t7173282mg277/fulltext.pdf (accessed 13 July 2007).

Griffiths MD and Parke J (2002) The social impact of Internet gambling. *Social Science Computer Review* 20(3): 312–320.

Griffiths M and Wood RTA (2000) Risk factors in adolescence: The case of gambling, videogame playing, and the Internet. *Journal of Gambling Studies* 16(2–3): 199–225.

Griffiths M, Wood RTA and Parke J (2006) A psychosocial investigation of student online poker players. Presentation at the 13th International Conference on Gambling. Lake Tahoe, Nevada.

Helstron AW, Bryan A and Hutcchison KE (2007) Internet gambling among college students. *International Pediatrics* 22(2): 66–69.

Horton KD, Harrigan KA, Horbay R and Turner N (2001) *The Effectiveness of Interactive Problem\ Gambling Awareness and Prevention Programs*. Ontario Substance Abuse Bureau, Ministry of Health and Long Term Care.

Jonsson J (2008) Responsible gaming and gambling problems among 3000 Swedish Internet poker players. Presentation at the 7th European Association for the Study of Gambling Conference. Available at: http://www.assissa.eu/easg/thursday/1400-ses3/jonsson_jakob.pdf (accessed 21 December 2010).

Jonsson J and Ronnberg S (2009) Sweden. In Meyer G, Hayer T and Griffiths M (eds) *Problem Gambling in Europe.* New York: Springer, 299–316.

King SA (1999) Internet gambling and pornography: Illustrative examples of the psychological consequences of communication anarchy. *CyberPsychology and Behavior* 2(3): 175–193.

King SA and Barak A (1999) Compulsive Internet gambling: A new form of an old clinical pathology. *CyberPsychology & Behavior* 2(5): 441–456.

Kyngdon A and Dickerson M (1999) An experimental study of the effect of prior alcohol consumption on a simulated gambling activity. *Addiction* 94(5): 697–707.

LaBrie RA, LaPlante DA, Nelson SE, Schumann A and Shaffer HJ (2007) Assessing the playing field: A prospective longitudinal study of Internet sports gambling behavior. *Journal of Gambling Studies.* 23(3): 347–362.

Ladd GT and Petry NM (2002) Disordered gambling among university-based medical and dental patients: A focus on Internet gambling. *Psychology of Addictive Behaviors* 16(1): 76–79.

LaRose R, Mastro D and Eastin MS (2001) Understanding Internet usage: A social cognitive approach to uses and gratifications. *Social Science Computer Review* 19(4): 395–413.

McMillen J and Woolley R (2003) Australian online gambling policy: A lost opportunity? Presentation at the Pacific Conference on I-Gaming, Alice Springs.

Monaghan S (2009) Responsible gambling strategies for Internet gambling: The theoretical and empirical base of using pop-up messages to encourage self-awareness. *Computers in Human Behavior* 25: 202–207.

Motivaction International (2005) Netherlands participation in paid interactive Internet gaming. Available at: http://www.toezichtkansspelen.nl/information.html (accessed 21 December 2010).

Olason DT and Gretarsson SJ (2009) Iceland. In Meyer G, Hayer T and Griffiths M (eds) *Problem Gambling in Europe.* New York: Springer, 137–152.

Petry NM and Weinstock J (2007) Internet gambling is common in college students and associated with poor mental health. *The American Journal on Addictions* 16: 325–330.

Sandven UH (2007) The present situation in Norway. Presentation at the 6th Nordic Conference on Gambling and Policy Issues, 21 May, Copenhagen. Available at: http://www.snsus.org/pdf/20070521/unn_hovda_sandveen-snsus_2007.pdf (accessed 21 December 2010).

Schull ND (2005) Digital gambling: The coincidence of desire and design. *The Annals of the American Academy of Political and Social Science* 597 (1): 65–81.

Shaffer HJ (1996) Understanding the means and objects of addiction: Technology, the Internet and gambling. *Journal of Gambling Studies* 12(4): 461–469.

Swiss Institute of Comparative Law (2006) *Study of Gambling Services in the Internal Market of the European Union.* Final report prepared for the European Commission.

Williams RJ and Wood RT (2007) *Internet Gambling: A Comprehensive Review and Synthesis of the Literature.* Final report prepared for the Ontario Problem Gambling Research Centre.

Wood RT and Williams RJ (2007a) Problem gambling on the Internet: Implications for Internet gambling policy in North America. *New Media & Society* 9(3): 520–542.

Wood RT and Williams RJ (2007b) How much money do you spend on gambling? The comparative validity of question wordings used to assess gambling expenditure. *International Journal of Social Research Methodology: Theory & Practice* 10 (1): 63–77.

Wood RT and Williams RJ (2009) *Internet Gambling: Prevalence, Patterns, Problems, and Policy Options.* Final report prepared for the Ontario Problem Gambling Research Centre.

Wood RT, Williams RJ and Lawton P (2007) Why do Internet gamblers prefer online versus land-based venues? Some preliminary findings and implications. *Journal of Gambling Issues* 20 (June): 235–250.

Wood RTA and Griffiths MD (2006) The GamAid Pilot Evaluation Study. Presentation at the Global Remote and E-Gambling Research Institute Conference, August 31, Amsterdam.

Woolley R (2003). Mapping Internet gambling: Emerging modes of online participation in wagering and sports betting. *International Gambling Studies* 3(1): 3–21.

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